

March 12, 1951.

(A) (B)
776-370 and -373 were found to be lysogenic for W518. Also for W811.
Pick plaques on W518 to produce a W518 L₄₅.
Although supplied as separate cultures ^{from W.P.H.L.} 370 and 373 may well be identical.
They were the sole S^R in their groups and resemble each other culturally.

None of 8 W518 recovered early from plaques from A and B.
Inoculate A + B together with W518 for preliminary growth of the phages.

High titer stocks obtained on W518. W518 survivors were
 λ^{370} 18/20. 2 R.
None lysogenic.

Attempt to induce or modify lysogenicity - re λ^{370} .
Inoculate suspension + λ^{370} stocks into Penmassay.

1	W1248	PR	λ^-	
2	1027	S	-	
3	1177	R	+	called none lysogenic against W1177
4	677	S!	+	
5	660	S	+	
6	58-161			} 10 each tested none lysogenic against W1177
7	W518 + λ + λ^{370}			

	A	B	C
Antigen .5ml	1:10	1:20	1:40
Antiserum .5ml undil.	(serum 117).		

Incubate at 37°. Then centrifuge
sediment the precipitate.

a) Supernatants: Dilute A 1:4 B 1:2 C ~~1:1~~ undil.

Take .1ml samples to 5ml H₂O, 1ml nfg 1/200 in 1/20 buffer
inc 37° 10 mins. Add 1/1 Na₂CO₃.

nfg: A > B > C.

b) Wash ppt's twice. Resuspend in 1ml saline. Assay .1ml
samples as above, 20 mins. Add Na₂CO₃.

nfg A > B > C. ca 1/5 as active as supernatants

A	.5ml antigen	.5ml antiserum.	to 1ml volume
B	.05	"	+
C	.005	"	

D
E
F
G
H
I

with .5ml NaCl rather than serum

G = 3x washed ppt's. of ABC.

~~For control of ppt. washing, also
add antigen to boiled serum ppt~~

Assay .5ml samples, equivalent to 1:100 dilution (C).

1	- 008	227
F	020	620 sic!
C	128	142
F	005	1
F	004	1
F	010	0
F	002	1
F	018	

Protective effect
of serum ???
(over)

Assay antigen!

827:) Assay antigen:
dilute 1:100. 1:1 with saline, then as

in previous assays.

ca 500.

H281

3/19/57 H289 is M⁺UVglu⁺lac⁺ Mal⁻, + v?

Inoc D(Mal) 10ml with mixed growth from original EMS M⁺ streptomycin, incubate in air 24h. Plate out at 10^{-7} on EMS Mal, EMB Mal, M⁺.

EMB M⁺ plating shows 90% M⁺. On EMB Mal, no clear Mal⁻ colonies are seen, but very numerous mottled Mal⁺, which might be Mal^{+/-} ... v.

↪ ca 30: all Mal⁺⁺ 20 all ++ Mostly M⁺.

This "culture" is probably a duplex pair Mal⁺, - resp. Check Mal⁻ for hemizygosity.

824-8
H288

829

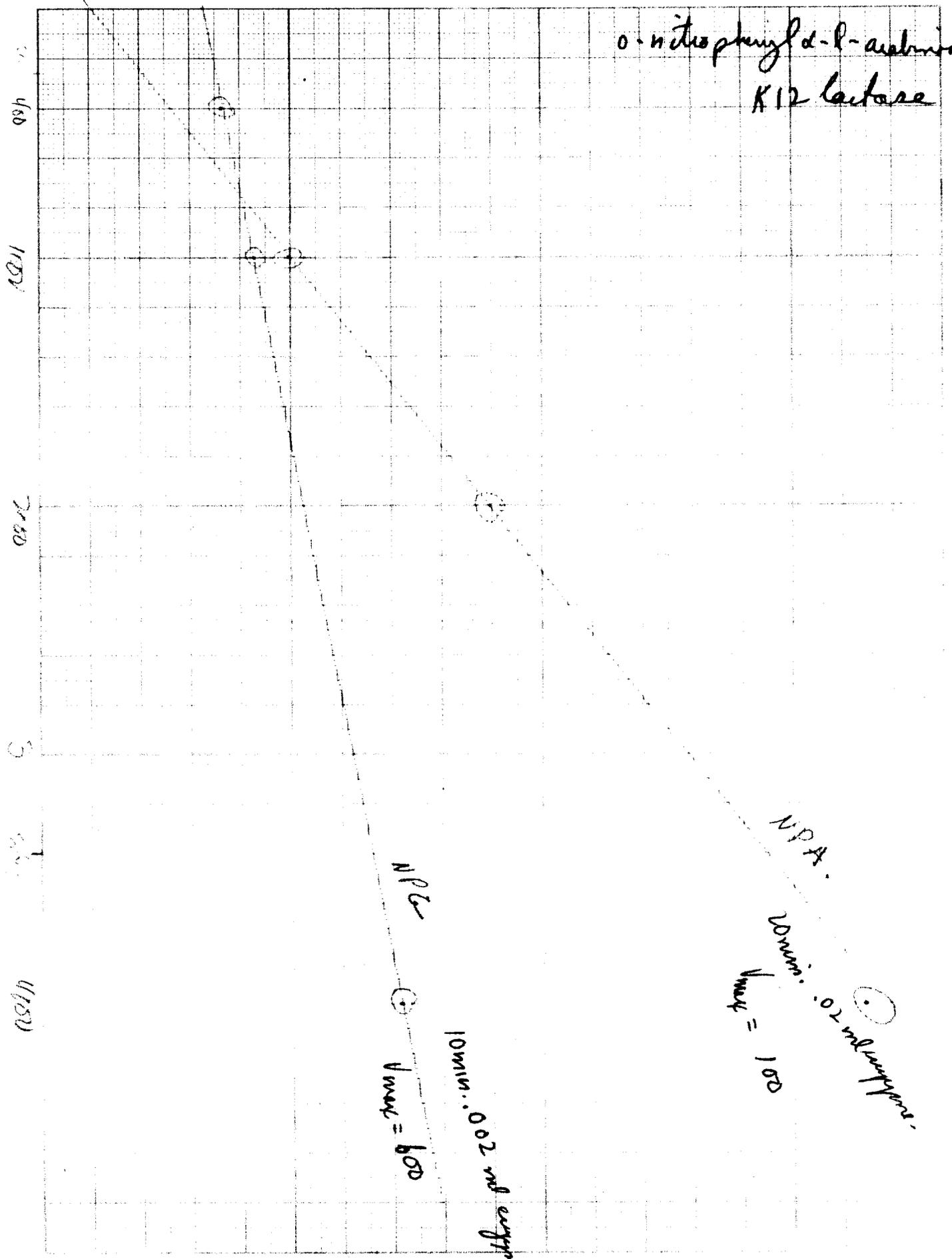
3/17/44. /50.

H288 is Lac- MHV Xyl+ Mal- from W466 x W1577
B71 Lac- W660 Lac+
T5³(?) V.R.

Each of 16 Lac+ reversions in EMS Lac was found to be Lac⁺ MHV
but the latter character is difficult to score.

∴ Lac- derived from reverse cross is also homozygous.
From this one might argue that the corresponding Lac+ found
in the cross W478 x W1490, etc., are also homozygous.
Compare 819 for similar data on Mal.

o-nitrophenyl-d-l-arabinoside
K12 lactase



NPL

10 min. 0.02 ml enzyme
 $A_{max} = 600$

NPA

10 min. 0.02 ml enzyme
 $A_{max} = 1000$

10 min. 0.02 ml enzyme

100

1
2
3
4
5

Df
098
150 //
470
880
128

γ_v γ_s
102
67

Enz. Sub $M/100$

20min	1	.02	NPA	.5	061	164	4000
	2	"	"	1	112	89.3	2000
	3	"	"	2	201	49.7	1000
	4	"	"	5			
10min	5	.002	NPG	.5	139	71.9	4000
	6	0.002	"	2	234	42.7	1000
	7	"	"	5	276	36.2	400

A ~~259~~ 256
 B ~~279~~ 271 *still different*

$\frac{20min}{V_{max}}$ NPG 606 $K_s / M/3400 = 2.9 \times 10^{-4}$
 NPA. 1000 $K_s \quad M/250 \quad 4 \times 10^{-3}$

March 26, 1951.

1, 2, 3 : MH^- - Mal^- - Lac^v . Growing poorly on $EM^S Lac$.

(These heterozygotes give almost a - reaction on $EM^S Lac$, requiring 48 hours to give a full + reaction. (Modifier or pleiotropic effect?)

→ Each gave a MH^+ + Lac^v reversion with stronger lac^+ reaction.
 $\therefore MH^-$ is hemizygous.

	lac	mal	Xyl	Isolated EMS ⁺ lac ⁺	
1	✓	-	✓	✓ ⁺	Xyl ⁺
2	✓	-	✓	✓	
3	✓	-	-	✓	✓ ⁺
4	✓	+	-	✓	✓
5	✓	-	-	✓	?
6	✓	-	✓ ⁺	+	Xyl ⁺

In B, C 1 EMS⁺lac⁺ colony was picked as purified diploid stock.

3, 4, 5 each gave Xyl⁻ reversions after storage on EMS Xyl

∴ Xyl⁻ here is Xyl⁺ =

	lac	Mut	Xyl	isolated EMS lac
1	?	-	-	v? - mottled but not lac ⁻ . Maybe lac ⁺ /lac ⁺
2	?	-	-	+ xyl ⁻
3	v	-	v	v
4	v	-	v	+ xyl ^v
5	v	-	v	v
6	v	-	v	v
7	v	-	v	v
8	v	-	v	v
9	v	-	v	v
10	v	-	v	v
11	v	+	+ v	v
12	v	-	v	v
13	v	-	v	v
14	v	-	-	v v ⁺ v
15	v	+	+	v
16	v	-	v	v
17	v	+	+	v
18	v	+	+	v
19	v ?	-	v	v+ (?)
20	v	+	+	v

Note correlation here also between xyl⁺ and Mut⁺. Would it be possible to arrange to have Xyl media reversed to verify the homozygosity of xyl⁺ in this case?

Maun 30 of 1951

Lact	Mal	Lact *	Lac - *	% [PR]	
A 1		78	18	19	96
2		82	17	18	99
3		98	30	23	129
4		130	23	28	155
5		151	46	23	197
6		127	30	19	157
7		96	25	21	121
8		120	47	28	167
9		123	38	24	161
10		159	25	13	184
11		106	45	30	151
12		59	22	27	81
13		125	43	22	168
14		139	44	24	155
15		143	45	24	157
16		122	32	21	154
<hr/>					
		1458	530	21%	2488

478
~~(587)~~ x W660) x W1394 (Y105R)

97: 23
 83: 17 17

Lact Mal

1	10	41	20	51
2	69	113	38	182
B 3	30	105	22	135
4	29	112	21	141
A 5	56	101	36	157
6	31	68	32	99
7	80	134	37	214

x 1585
 25: 95
 32: 64

A

26	88	31 *	24	129
46	36 *	77	31	113
56	103	21 *	17	124
64	3	16		19
7	27	54		

.... 28: 78 1394
 82: 14 1177
 1394

*1, 3 were
 suite*

April 2, 1951.

Lact + Malt + yeast B, C, D x W1177 - EM5 lac, Malm

B (++) 4 plates 1 Lac

C (++) 3 plates 1 Lac -

D ++ 4 plates 0.

Nearly sterile!
Repeat of K-12.
Using W1367, W1177 as parents.

			Lact +	-
K	1	[x1367] xW1177	2	52
	2		2	26
A	1		38	150
	2		26	246
B	1		0	3
	2		0	10
C	1		10	10
	2		2	27
D	1		17	89
	2		20	186

~~W1367~~
nuclear pattern
should be repeated.

Repeat A: (extreme ratios)

	L+	L-	% +
A10	97	23 *	
A11	83	17 *	

B1	25 *	95
B2	"32" *	"64"

C4	28 *	78
C5	82	14 *

of K x	W1177	1015	1022
	Lact +		
	44 90	sterile	sterile!

[Not surprising since 1015 and 1022 are s^s!!!]

Auxotroph partial size mutants.
(Septoids)

833

March 1951

		Recovery in Lac, via D(Lac) + auxosp.	
1	754A2	M - lacv Mal -	- , + pap
2	754A1	M " "	" "
3	754B5	TL - lacv Mal -	-
Y	H244	M - lacv Mal -	-
5	754B6	noqr. TL lacv Mal -	-
6	754B11	T ₁ B, lacv Mal -	ng
7	754B3	L - lacv Mal - Xyl -	-g
8	H245	M - lac Mal Xyl Mtlv	lacv
9	H244M+	M lacv Malv	+ -
10	H246	TL lacv Mal -	lacv

lacv out?
Recover lacv
TL
Prototrophii

H245 and 246 reisolated.

Grow in D(Lac) + BM or TLB₁.

Cross H245 x W1177

H246 x W1387

Recheck restriction:

H245 TL
246 prototrophii!

833-1 M⁻ Pure lacv? (same nothing)
833-2 M⁻ lacv

= H290
= 754A1

Diploid crosses.

833a

April 4, 1951.

H245 TL- Lac⁺ Mal⁺ Xyl⁺ MR⁺ v

H290 M- Lac⁻ Xyl⁻ Mal⁻

A. H245 x H290 EMS Lac, Mal

B H245 x W1367

TL	BM	Lac ₁	MR	Mal
-	(+)	+	+	+
-	(-)	-	-	-
+	-	- ^m	+	+

C H290 x W1585 (= W1177 Mal⁺)

+	-	+	-	-
(-)	-	-	-	-
#	+	-	-	+

Mostly lac⁺
 A. (Lac): occasional lac⁻; wide range of lac⁺ types. Pick 40:
All are lac⁻ v except # 6, 8, 30, which are lac⁻. The absence of
 lac⁺ is easily understood as the parents are each doubly heterozygous. lac⁺ v / +

(Mal). Mostly Mal⁺, as above. Colonies ^{on EMB Mal} are difficult to interpret
 = A41-80 as there may be admixture. They are either Mal⁻ v or Mal⁺ v (except
 62 +?, 43 Mal⁻).

Hold, if necessary, for analysis of A. But test for lac⁻ Mal⁻ v.

B As A (Lac)

C Mostly -? →

+	-	v
+	+++	
+	+++	+++
+	+++	+++
+	+++	+++
+	+++	+++

several +, - streaks noted!

(see over)

833A.

nal status not clear.

4/20/51. Probably + / -

Maybe ++ / - ?

April 7, 1951.

Restrales 1-40 m EMB Lac (4/7), EMS Lac (4/8) \int EMB Lac 4/7 ^{reported} (H. Hillman)

Lac \checkmark except 6, 8, 30. 28 maybe +, -

#6, 8 appear Malv or +^v, like others. 28 is Mal+, -

30

(41-80: 41, 50, 52, 61, 64, 67, 69, 77 are lac -, other lac \checkmark .)

4/10. Repur. single EMS Lac 28 \rightarrow Lac+, Lac-
6, 8, 30 Lac-

	Lac	Mal	MHV
1	\checkmark	+ ^v	+ ^v
2	\checkmark	+ ^v	+ ^v
3	\checkmark	v	+ ^v
4	\checkmark	+ ^v	+ ^v
5	\checkmark	+ ^v	+ ^v
6	-	+ ^v	+ ^v
7	\checkmark	+ ^v	+ ^v
8	-	+ ^v	+ ^v
9	\checkmark	+ ^v	+ ^v
10	\checkmark	+ ^v	+ ^v
11	\checkmark	+ ^v	+ ^v
12	\checkmark	+ ^v	+ ^v
13	\checkmark	+ ^v	+ ^v
14	\checkmark	v	+ ^v
15	\checkmark	+ ^v	+ ^v
16	\checkmark	+ ^v	+ ^v
17	\checkmark	+ ^v	+ ^v
18	\checkmark	+ ^v	+ ^v
19	\checkmark	+ ^v	+ ^v
20	\checkmark	+ ^v	+ ^v
21	\checkmark	+ ^v	+ ^v
22	\checkmark	+ ^v	+ ^v
23	\checkmark	+ ^v	+ ^v
24	\checkmark	+ ^v	+ ^v
25	\checkmark	+ ^v	+ ^v
26	\checkmark	v	+ ^v
27	\checkmark	+ ^v	+ ^v
28	\checkmark	v	+ ^v
29	\checkmark	+ ^v	+ ^v
30	-	+ ^v	-
31	\checkmark	+ ^v	+ ^v
32	\checkmark	+ ^v	+ ^v

Definitely \rightarrow occasional Mal-, Mal+.

Malv \checkmark
Malv \checkmark
Malv \checkmark
Malv \checkmark
Malv \checkmark

v⁻ compare original and derived.

As previously, it is difficult to distinguish Mal and MHV from + modified by segregation of other factors. But most or all appear to be Mal+/-

	lac	Mal	Mfl
33	✓	✓	+✓
34	✓	+✓	✓
35	✓	+✓	+✓
36	✓	+✓	+✓
37	✓	+✓	+✓
38	✓	+✓	+✓
39	✓	+✓	+✓
40	✓	+✓	+✓

Compare B3A (original) and BBB (dewid)

April 7, 1951.

H245 x W1367 S^R Mal⁺ Lac^{-m} x T-L- Lac⁺ Mal^v ...

Actual²⁴ spots on EMS Lac.

#15 is Mal⁻, others +^v or v (from spots only).

4/9/51. Replicate single EMS Lac colonies and test:

	Lac	Mal	MH	S	Sm
1	✓	v	v	S	✓
2	✓	v	"	S	✓
3	✓	+v	"	S	✓
4	✓	+v	"	S	✓
5	✓	+v	"	S	✓
6	✓	v	"	S	
7	✓	v	"	S	
8	✓	v	✓?	S	✓
9	✓	v	v	S	✓
10	✓	v	v	S	✓
11	✓	+v	+v	S	
12	✓	+v	+v	S	
13	✓	+v	+v	S	
14	✓	v	+v	S	
15	✓		+v	S	
16	✓	v	v	S	
17	✓	v	v	S	
18	✓	v	v	S	
19	✓	v	v	S	
20	✓	v	v	R?	
21	✓	v	v	R?	
22	✓	v	v	S	
23	✓	v	v	S	
24	✓	v	v	S	

Mal⁺ v Lac^{-s}
 Mal^v Lac^{-m}
 Mal^v (→ Mal^v with much higher Mal⁻ component than original)
 Mal^v - demonstrated

Mal^v ✓

→ Mal^v on recessive Lac^{-s} / Lac^{-s}

too few initial segregants for critical determination as + mottled or v on Mal, MH.

✓1367 S^R ✓.

A number of types are probably represented. Mal⁻ should be specifically tested for hemizygosity. Study for distributions of Lac^{-m} / Lac^{-s}. Assume lac₄-lac₊ to be present

Plate out B1, 2, 15, 16 from D(Lac) to EMB Lac, Mal, EMS.

1. Lac⁺, relatively stable +

Mal Mottled, no -.

2. Lac^v (reconstable +).
 \downarrow
 Lac^{-m}.

Mal highly variegated, mostly -.
 ca. 24 Mal⁺ and Mal⁻ segregants: each Lac⁻ each colony
 partial segregation is infrequent.
 Pure +, - about =.

EMS Mal: Pure +

15 Lac^v like 1.

Mal: pure -

plate on EMS Mal

16 Lac^v (like 1)

Mal like 1.

Mal⁺ are apparently Mal⁺, with segregating modifiers. These should perhaps be studied as stable tetrads.

B2 should be studied for interdependence of Mal and Lac segregation.

M290 x W1585

833C

BM Lacv

TLB, Lac - Mal + S^R

D

April 7, 1951.

Recover from EMS Lac.

4 Lac+ or Lacv.

also test 12 other Lac- for S^{R/S} (EMS vs EMS)
(none were S^S on EMS Mal.)

	Lac	Mal	(sm)
1	v	v	S
2	v	+ v	R mottled
3	v	v	S
4	+	+	R

This illustrates that Mal is not eliminated in this ~~2n~~ 2n x 1n cross (unless #2 is hemizygous). It should perhaps be repeated to look for Mal -

D: W1490 x H245

BM Lac + S^R V₆^R TL Lacv... V₆^S ?

	Lac	Mal	sm ^{EMS}	EMB
1	v	v	S	S
2	v	v	S	S
3	v	v(+)	S	S
4	v	v(+)	S	S
5	v	v+	S	S
6	v	v*	S	R
7	v	v	S	S
8	v	v	S	S
9	v	v	S	S
10	v	v	S	S
11	v	v	S	S
12	v	v	S	S
13	v	v	S	S
14	v	v	S	R
15	+	+	S	R
16	v	v	S	R
17	v	v	S	S
18	v	v	S	S
19	v	v	S	S
20	+	?	S	R

EMB Mal scoring imperfect

April 14, 1951.

H245 x W1606

TL lacvMalr BMSP
Lact+

	Lac	Mal	S ^{EMB}
1	✓	-	S
2	✓	+	S
3	✓ +	+	S
4	✓ +	+	S
5	✓	+	S
6	✓	+	S
7	✓	+	S
8	✓	+	S
9	✓ +	+	S
10	✓ +	+	S
11	✓	+	S
12	✓	+	S
13	✓	+	S
14	✓	+	S
15	✓ +	+	S
16	✓ +	+	S
17	✓	+	S
18	✓	+	S
19	✓	+	S
20	✓	+	S
21	✓	✓	S
22	✓ +	✓	S
23	✓ ✓	✓	S
24	✓	✓	S
25	✓	✓	S
26	✓	✓	S
27	✓	✓	S
28	✓	✓	S
29	✓	✓	S
30	✓	✓	S
31	✓ +	✓	S
32	✓ +	✓	S
33	✓ +	✓	S
34	✓	✓	S
35	✓ +	✓	S
36	✓ +	✓	S
37	✓	✓	S
38	✓	✓	S
39	✓ +	✓	S
40	✓ +	✓	S

These are uniformly
Malt or Malr carrying
the Mal factor from the
diploid parent!
Study 833E1 for Mal-hemizygosity

all S^S

16 others all S^S

Purified H245 x W1602.
on EMS Lac.

TL lac^r Mal^v x DM Lac - Mal - S^R

	Lac	Mal	MFR	S
1	✓	+	✓	
2	✓	+	✓	
3	✓	+	✓	
4	✓	+	✓	
5	✓	+	✓	
6	✓	+	✓	
7	✓	+	✓	
8	✓	+	✓	
9	✓	+	✓	
10	✓	+	✓	
11	✓	+	✓	
12	✓	+	✓	
13	✓	+	✓	
14	✓	+	✓	
15	✓	+	✓	
16	✓	+	✓	
17	✓	+	✓	
18	✓	+	✓	
19	✓	+	✓	
20	✓	+	✓	
21	✓	+	✓	
22	✓	+	✓	
23	✓	+	✓	
24	✓	+	✓	
25	✓	+	✓	
26	✓	✓	✓	
27	✓	✓	✓	
28	✓	✓	✓	
29	✓	✓	✓	
30	✓	✓	✓	
31	✓	✓	✓	
32	✓	✓	✓	
33	✓	✓	+	
34	✓	✓	✓	
35	✓	✓	✓	
36	✓	✓	✓	
37	✓	✓	✓	
38	✓	✓	✓	
39	✓	✓	✓	
40	✓	✓	✓	

all S^R on EM13 Xyl

These diploids resemble those of 833B and 833D.

evidently, the BM parents do not contribute to the Mal-S factors of these heterozygotes. The possibility that these are 3n-2n aneuploids remains open. (cf. B or D).

↳ when H245 is one parent.

Asexual + colonies from certain Mal plates. All but 10 and 23 showed apparently only Mal+, these also had rare Mal-. It is possible that there are all Mal^v but that repressors occur rarely. Appropriate S^R markers would facilitate the characterization of these diploids.

Compare original and derived $\text{lac}^+/\text{Mal}^+$

833a

April 21, 1951.

Compare original & derived (selected as Mal^+) from 833:

1	A9 A9 - σ	lac^+	Plagues noted in thick streak. Mostly lac^- + red background.
2	- d		
3	B3 - σ	lac^+	
4	- d	lac^- only	

Restreak G2 on EMS lac to recover heterozygote. Source of λ^S ??

✓ Plagues may be unique phage, rather than λ^S .

This is confirmed. The phage attacks all λ^+ , λ^R types and resistant mutants are not altered to λ (E.M.L.)

May be merely a contaminant see EML 163

	BM	TL
A H245 x H290	lacv Mal-	lacv Malv
B H245 x W1367	≠ Lac ^m Mal+ S ^R	
C H290 x W1595	lacv Mal-	Lac- Mal+ S ^R
D H245 x W1490	Lac+ V _i ^R S ^R	lacv Malv
E H245 x W1606.	SD	lacv Malv
F H290 x W1602	S^R Mal- lac	lacv Malv
H245?	lacv Mal-	lacv Malv S^R

- A. No Mal- seen. Many are clearly Malv, but with scarce Mal- segregants.
?? Are lac- haploid or diploid segregants??
- B. Majority are Mal+ , probably not Malv. Also, seemingly S^S, including #2 Malv.
Some would be expected to be S^R/S^S.
- C. Many lac-. of lac+, (mostly) Malv S^R_v.
- D. Mostly lacv Malv. S?
- E ditto no S^D
- F. ditto no S^R. Malv+.

The Malv complex of H245 is retained intact in crosses with BM. Review H290 behavior.

H245 = TL lacv Malv
H290 = BM lacv Mal-

Depleted SRP xx.

234

March 30, 1951.

A H283 x W1177
B " W1490
C " W1387

mEMS Lac sm.

Stuile

ca 20-30 lact → pure lact

1 Lac? → Lac-

Should be repeated if a reason to carry out this experiment can be thought of.

April 2, 1951.

- a) inheritance through addnl. crossing → 2 lacv / 40 tests. = 835 C1-C2
- b) linkage relationships - preliminary survey.

- A. 58-161 x W1022 ± B₁ } on EMS lac, Mal, Mtl
- ~~B. W1490 x W1022 ± B₁~~
- C. 58-161 x W1178 EMS lac to isolate lacv.

	+	-	L	M	Mtl	L	M	Mtl
A:	Lac	49 61 2? 2?	+	-	-	-	-	-
	Mal	29 22 0 0 1	+	-	-	-	-	-
	Mtl	65 34 21 10	-	+	-	-	-	-
	Xgl	62 6-(?)	+	+	-	+	+	-
A (+B ₁):	lac	110 49 7 7	+	+	-	+	+	-
	Mal	21 0 0 0	+	-	+	+	-	-
	Mtl	19 16 4 12	+	+	-	+	-	-
C	lac	35 23 3 2	-	-	-	-	-	-
	Mal		-	-	-	-	-	-
	Mtl		-	-	-	-	-	-
C + B ₁	lac		-	-	-	-	-	-
	Mal	41 46 2 5	-	-	-	-	-	-
	Mtl		-	-	-	-	-	-

C1, C2 are two lacv isolated from 40 tests.

Both are Mal - purified segregate

Mtl - occurs relatively frequently, not necessarily associated with lac -, Mal -

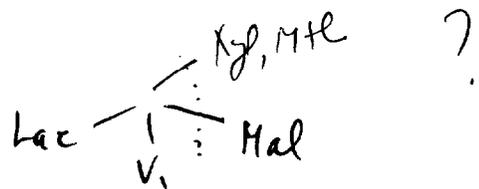
	Lac	Mal	MH	Xyl	TS	TS
1		+	+	+	S	S
2		+	+	+	S	S
3		+	+	+	S	S
4		+	+	+	R	S
5	+	+	+	+	S	S
6	+	+	+	+	S	S
7		+	+	+	S	S
8		-	+	+	S	S
9		+	+	+	R	S
10		+	-	-	S	S
11			+	+	S	S
12			+	+	S	S
13			+	+	S	S
14			+	+	S	S
15			+	+	S	S
16	+	+	+	+	S	S
17			+	+	S	S
18			+	+	S	S
19			+	+	S	S
20			+	-	S	S
21			+	+	S	S
22			+	+	S	S
23			+	+	S	S
24			+	+	S	S
25	+	+	+	+	S	S
26	+	+	+	+	S	S
27			+	+	S	S
28			+	+	S	S
29			+	+	S	S
30			-	-	S	S
31			+	+	R	S
32			+	+	S	S
33			+	+	S	S
34			+	+	S	S
35			+	+	S	S
36	+	+	-	-	S	S
37	+	+	+	+	S	S
38			+	+	S	S
39			+	-	S	S
40			+	+	S	S
Lac-						
1	-	+	-	-	S	S
2	-	+	+	+	S	S
3	-	+	+	+	S	S

See 845

~~Archaea TS tests.~~

Xyl - MH.

No lac - V₁ linkage seen.



58-161 x W1022

Pick out random from D(0). Beersham EMS lac

9- : 111+

Pool with lac- from EMS lac cross plates
 streak out on EMS lac to purify and complete

Characterization:

	Lac	MAL	Xyl	Mal	T5
1	-	-	-	+	S
2	-	+	-	+	S
3	-	+	+	+	S
4	-	+	+	-	S
5	-	+	+	-	S
6	-	-	-	-	S
7	-	+	+	+	S
8	-	+	+	+	R
9	-	-	-	+	S
10	-	-	+	+	R
11	-	+	-	+	R
12	-	+	+	+	S
13	-	-	-	+	S
14	-	+	+	+	S
15	-	-	-	-	S
16	-	-	-	-	S
17	-	+	+	-	R
18	-	+	+	+	S
19	-	-	-	+	R
20	-	+	+	+	S
21	-	-	-	+	S
22	-	+	+	+	S
23	-	+	+	+	S
24	-	-	-	-	R
25	+	-	-	-	R
26	+	-	-	-	S
27	+	+	+	-	S
28	+	+	-	-	R

% 1022 parent among

	Lac	Mal	MAL	Xyl	T5
lac+	1/90	1/40	3/40	5/40	3/40
lac-	ca.	7/24	10/24	11/24	6/24

lac+ not greatly different from lac-
 except for slight increase in

Mal-
 from
 EMS Mal

835 C

	B-	M-	T-	L-	+	100	
1	+	+	-	+	+	+	T-
2	+	+	+	+	+	-	T-
3	+	+	-	+	+	-	M-
4	+	+	+	+	+	+	T-
5	+	+	-	+	+	-	T-
6	+	+	-	+	+	+	
7	+	+	+	+	+	+	MFL-
8	+	+	-	+	+	-	
9	+	+	+	+	+	+	MFL-
10	+	+	-	+	+	-	MFL-
11	+	+	-	+	+	+	MFL-
12	+	+	+	+	+	-	M-
13	+	+	+	+	+	+	MFL-
14	+	+	+	+	+	-	

Abernant Luggage

~~835 a.~~
835 a.

April 26, 1951

58.161 x W1022

E/MS vac:	
+	-
55	1
48	1
57	1
20	0
30	0
<hr/>	
210	3

EMS Mal	
+	-
46	0
22	0
38	1 (see)
22	0
<hr/>	
128	1

1 1/2% - !

check out 70 EMSact → EMSvac.
3 -

s. second col.

April 2, 1951.
W1490x

- A 1508 → lacv : MH -, v, +.
B 1511
C 1512
D 1513.

Most tests known defective EMS! Repeat likely lacv from EMS and retest!

A 1-8 lacv 1 MH+^v 2 MHv 3, 4, +v 5 v 6, 7 - 8 +
9 10 11 12 15 lacv)) 9 +^v 10 11 12 v ~~13 MH-~~
B No peculiarity this cross (cf. 831 A) 35-40 are lacv.

- 1 MH+ lacv ?
2 " " "
3 " " "
4 MH- lacv ?
5 MH- lac+ ?
6 MH- " "

C 1512 } No clear lacv. Repeat cross on
D 1513 } EMS lac.

B. 4 single colonies / prototrophs checked. EMS lac →

1	abcd lac ^v MH+	all MH+
2	v + (+ mottled)	" " -
3	v +	" " +
4	+ faded - (Lac somewhat faded)	" " -
5	+ faded -	" " -
6	+ faded -	" " -

W1511 MH+ has some epistatic effect on lac+. cf 831A

C : Repeat cross 4/2/51. EMS lac.
Poor yield.

D :

April 4, 1951. ff

W1508 x W1490.

16 picked and tested as lac^v from 40 initial tests.

1-10 lac^v Mtl^v (out).

11-13 lac^v Mtl⁻

Apply for hemizygosity tests.

Check single EMS lac colony selections:

	lac	Mtl	Mal	Mtl ^v
1	v	v ?	+ v	Mtl ^v
2	v	v	-	
3	v	v ⁺	-	
4	v	v	-	
5	+	v	-	
6	v	v	+	✓
7	v	v	-	
8	+	+	-	
9	v	v ⁺ ?	+	- Mtl ^v
10	v ⁺	v	-	
11	v	-	-	
12	v	-	-	
13	v	-	-	

Recheck 1, 9, ~~10~~ on Mtl, Mal

∴ of 3 Mtl⁺, 2 are Mtl⁺

linkage data

	Mtl ⁺	-
Lac ⁺	2	18
+	1	19

no linkage to lac^v very low ratios.

Strike out 11-13 on EMS Mtl for reversion.

Reversion apparently pure Mtl⁺! ✓ Mtl⁺ lac^v.

The Mtl⁺ may well be a suppressor mutation.

very striking
recv!

April 5, 1951.

C W1490 x W1512.

- ① check linkage M^H/lac (diploid transfer Lac⁺, Lac⁻ colonies to EMS M^H)

M ^H	lac	+	-	no diploid interactions.
	+	5	2	
	-	15	18	

Pick 40 colonies, streak on EMB Lac for v.

~~(15
25+)~~ (0 4
26 9)

Lac⁺, some are of lighter tint.

No Lac^v !!

check M^H character for further linkage tests to EMS M^H

D W1590 x W1513 36 colonies for Lac v.

	lac	M ^H	Mal	
1	+	-	-	Re-streak these on EMS Lac ✓ on EMS M ^H .
2?	v	+	-	
3	v	+	-	
4	+	+	-	
5	v	+	-	
6	+	-	-	

Diploid transfer: linkage tests above.

	+	-
+	13	7
-	4	14
	16	6
	1	0

clear linkage to lac (probably to right)

BM V₆ Lac M^H V₁ FL....

(run)

April 12, 1951

- A. H257 suspensions from D(lac) streaked out on EMB lac, Mal on and possible S^R lacv or Malv repaired for test as auxotrophs. 2 apparent lacv (from several hundred S^R) recovered; both auxotrophic 837A-1 and A-2. Check mutations, S^R , etc. Both are Mal ~~Mal~~ -
1. eventually grows on D(o), but fastest on D(TLB₁) or D(B₄)
b-? or prototrophs?
 2. D(o) -
D(B₄) -
D(TLB₁) -
D(B₄TLB₁) +.

- B. H267, through Purnassay. Plated \rightarrow ca 10% lacv. Test colonies from EMB to D(o).
- | | | |
|----------|-------------------|-------------------------|
| 30 lacv. | # all prototrophs | #16? ✓ Mal 3 XylMH lacv |
| 20 MHv | | #16. |
| 6 Malv | | #3? |

- C. H257
- | | | |
|----------|-------------|---------------------------------|
| 35 lacv. | #17 auxotr. | others X ⁺ lacv Malv |
| 31 Malv | #7? " | " " — lac - Malv, - |

B1 (L)T - Mal Xyl MHK lac_{1/4} $S^{R/5}$ v.

C1 Mal lac M+ T+ L+ ...

n.g. for crosses.

prototroph. not heterozygous

H257-267 partial segregants

April 20 ff. 1951.

Irradiate H257, 267, 30 sec. 4V 50 cm. ca 20% survival.

Pick lac⁺ centers and streak out in E113 lac.

Repick lac⁺ or + (?) and ~~streak~~ spot on D(c); E113 lac (or brush against sm).

SR lac⁺ immediately after 4V, this number is low.

Some "lac⁺" gave very scarce lac⁺ - SR segregants! (lacks ??)

check for prototrophy:

H267.

	lac	sm	D(c)		lac	sm	D(c)
1	v	R	+	11	v	S	+
2	v	R ₀	-	12	v	R	+
3	v	R ₀	+	13	v	S	+
4	v	R ₀ !	+	14	v	R ₀	+
5	+ ⁺	R ₀ !	-	15	v	R ₀	-
6	+ ⁻	S	+	16	v	R ₀	+
7	+ ⁺	R ₀	-	17	v	S	-
8	v	S	-	18	v	R ₀	+
9	v	R ₀	-	19	v	R ₀	-
10	v	R ₀	+	20	v		

~~From~~ i.e., ca 9/19 prototrophs. } 9 S (maybe either S/S or S/R leth.)

also addnl. 4/8.

4 SR
8 SRS

Note very high frequency of "rearrangements" here (original H267 was SRS)

A - H257. 8x⁻ / 38 tests.

4/24 Restreak centers of 40 lac⁺ (usually ⊕) from H257, 267 4V on EMB lac. Pick possible lac⁺ (stable lac⁺) for test with sm

D) 4V - on ~~S~~ sm medium. Resolute single lac⁺.

(over)

Nutritional tests on auxotrophs.

A	1	T-	S _v
	2	M-T-	S _v
	3	MTL+	S _v
	4	MTL+	S _v
		S^S	
		S ^R	
		S ^S	
		S ^R	
		?	

B	1	M-	S ^S
	2	M-L-	S ^R
	3	MTL+	S _v
			S ^S
			V
			R
			V

April 16, 1951.

A series of S^R mutants isolated from W1483. (A-F)
 (Genotype: Tryp Lac-Mol-S^R)

(1) Grown separately

A K12 } EMS sm
 B. A }
 C A+K12 }

D SD-161 x A on EMS lac.

(2) Grown together K12+

A...F

3/20/51.

1 A 0
 B 0
 C 1 Lac+ Some very tiny papillae.
 D ca 40 small colonies, mostly lact or very small.

2

A 2+ 3-?
 B 2 tiny+; papillae in background. → W1611
 C 6+ 1-
~~B 1+~~
 D 12+ 1-
 F 6+ 1-

April 20, 1951.

~~W1606~~ W1606 x 831B1 ($W18A_2^R S^D$ x T(L) - lacv $S^{n/s}$ 14alv...)

Plate on EMS lac, EMS lac + sm.

831B1.

EMS lac heavily turtled

+ sm: faint colony background; 2 Lac +

↓
 control also gave Lac+ prototrophs. n.g. for crosses

Better stocks needed

2 Lac- 1 lac+ grew out. Test on sm; & traits out on
 EM1314al.

April 21, 1957.
W1394 x H290

Mostly lact.

EMSlac.

(see 833C).

11- (ca 1-2%)

lac- 2 of these are Malt+ - mE₂S^RMalt (= 4/5 total).

2 are Malt-

7 Malt.

✓ for S^v

20 lact: all lact S^R. (not v)

of lac- : 8 Malt S^R 4 Malt-S^S 1 Malt-S^S (paired i Malt S^S).

Most of these are ~~so~~ evidently not diploids.

~~Repeat in form~~

See ~~845~~ 837B.

①. At least one lac "+" noted which gave lac- in cross brush with sm. Restrales: apparently pure lac+. Test single colonies against sm.

→ ~~There~~ No lac- found in 8 strucls.

(previous lac- may have been spattered!)

Repels from boundary of sm inhibition and plate on EMS lac sm.

If there are hybrid lac+, we must greatly increase rate of crossing over.

9 additional H257 lac+	}	5 S ^V	3 S ^S	1 SR
4 " H267		5 S ^V	2 S ^S	2 SR.

* 1 gave relatively few SR. Resuels + compare with H257.
↓ not more stable!

②

1

auxotroph diploids from H26740.

843

Repeat auxotrophs of series B. Streak out and prepare for nutritional characterization

A SR
B SS
C SRS

Final set:

1	M-	SR	Mal-
2	M-	SR	Mal+
3	M-	SR	Mal v?
4	M-	SV	Mal v
5	TL-	SR	Mal-
6	TL-	SR	Mal+
7	TL-	SV	Mal v

✓	Mal-	S:	R
	✓		RRR
	-		RRR
	v?		RRV
	-		RRR
	+		RRR
	✓		✓

lac → lac⁺

Keep:

✓
✓
✓
✓
✓

April 27, 1951.

Fresh D(Lac) suspensions. Dilute 10^{-6} , irradiate 30 sec.

A. Control \odot predominates Plate .1 ml on EMB Lac.

B. UV 30s. ca 50-60% survival. \odot predominates
Isolate bacv from centers.

From one set MCHB Lac Sm. 843-1 and 843 isolated as M-Lacv S^R.

Isolate bacv from centers of 40 cols. Test for auxotrophy, S^R.

	Lac	S	Nutrition		Lac	S	Nutra
1	V	R	RS	11	V	SR	
2	V	R	R	12	V	SR	+
3	V	R	S	13	V	SR	
4	V	R	S	14	V	R	+
5	V	R	SRS+	15	V	R	+
6	?	R	-	16	V	SR	
7	V	R	RSms	17	V	SR	+
8	-	R	-	18	V	R	+
9	-	S	-	19	V?	S	+
10	-	S	- +	20	V?	S	
21	+	BR		31	-?	R?	+
22	V	R	+	32	V	R?	
23	V	R		33	0	0	+
24	V	RS	+	34	V	R	+
25	V	RS		35	V	RS	
26	?	S		36	-	S	
27	V	R	+	37	V	RS?	+
28	V	RS		38	V	RS	
29	V	S		39	V	RS	
30	V	S		40	V	SR	-

Most surviving leptoids are reorganized.

2700 (8-) nonparental - mostly parental
50 most are changed!

UV sensitivity of UV-surviving leptoids?

(2)

UV - effect - control

A 1	(E75) lac	Mal Xyl	Mal X	MHE	Lac	Mal X	MHE	L	M X	MHE	L	M X	MHE	L	M X	MHE	L
	++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++																

no partial segregants in
6 groups totaling 48 lac⁻ colonies.
" " " 18 " "

	Total	8	66 " "
--	-------	---	--------

A2

++ ++ ++ ++ ++ ++ ++ ++ ++ ++																				
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Colonies streaked from platings
of H207 (without = A; with UV 30s = B)
Each group are lac⁻ from one colony
Nuclei spots to EMBlac in rows -
Velvet transfer.

① - Isolation of armstrongish diploids 843

Nutritional tests by decalomania (wase. relvit)

	-M	-T	-L	+		
A 1	-	+	+	+	(BM)	1
2	+	+	+	+	(B)M	2
3	-	+	+	+		
BM	-	+	+	+		
B 1	-	+	+	+	M S ^S	3
2	-	+	+	+	M S ^S	4
3	+	+	+	+	L S ^S	
4	+	+	-	+	L S ^{RS}	5
T2B ₁ 1	+	+	-	+	M S ^{RS}	
2	-	+	+	+	ML S ^{RS}	
3	-	+	+	+	L S ^{RS}	
4	+	+	+	+	L S ^{RS}	
5	+	+	-	+		
6	+	+	+	+		
7	+	+	-	+		
8	+	+	+	+		
9	+	±	+	+		
10	-	+	+	+	M S ^{RS}	

May 4, 1951

5 PM

streaked on EMBlac

5/5
5 PM

5/6

5/8

A. Tetrathionate Beath.

(2 tubes) 1. Filtrate .5 ml	no colonies on sh.	← inhibited	0
2. K-12 .5 ml	Lact++		++
3. Filtrate + K.12 "	Lact++		++
4. T2	Lac-		Lac-

B. Penmassay 10 ml

1. Filtrate .5 ml	0	0	0
2. " + Boorn serum 1 ml	0	0	0
3. Serum (stability control)	0	0	0
4. + Serum + loopful T2 (Toxicity) control.	++++		

C. SS-Agar.

1-2 streaks K-12, T2	Turbid	SS - does not inhibit K-12
3 Plate Filtrate .1 ml	0	markedly
4 Filtrate + K12.	"	

D. D(0)

1. T2 Filtrate	0	0
2. " + W 677 677	0	Numerous minute cols. + background. + pinpoint.
3 T2 cells	+++	
4 W677	0	Few pinpoints.

streaked EMBlac
 → Xyl - only
 recovery of salmonella

E-F

1 T2 Filtrate	
2 Filtrate + 677	
" + K12 (lac)	

E	MH	1 + col. → Lac - MH+
		2 T ₁ - 0 pap
F	Xyl	0
		2 T ₁ - 0 pap.

probably salmonella? (does not aggl. in 0 serum)

peppier Mal slow Xyl - not salmonella! but spant. worsens

G = E 12/6 + W677

chl.

A. Grow W1577 ± T2F in Penmassay overnight. Plate
washed cells: ^{.5ml} ^{10ml} all sterile

B. Inoc. W1577 .1ml + ~~FFF~~ .1ml on EMS lac, D(0).
S414F

a. 1577 control } no colonies
b. S414F " }

c. ~~FFF~~ mixture: ca 2 very tiny "lact" per plate. Replicate
to EMS lac

↓
only lact.

D. T2F { + SW 435 → } prototrophs in D(0)
S414F } SW 414 → } no prototrophs

No interaction of Salmovella Zell line
with E. coli could be f (

Lac and Mal -

Mal-	LAC	SM GAL	XYL	MTL	SM MAL	EMS	SM
1	+	+	+	+			
2	+	+	-	-			
3	+	+	+	+			
4	+	+	-	-			
5	+	+	-	-			
6	+	+	+	+			
7	+	+	+	+			
8	+	+	-	-			
9	+	+	+	+			
10	+	-	-	-			
11	+	+	+	+			

Lac -

1		+	+	+	+
2		-	-	-	
3		-	-	-	
4		+	+	+	+
5		+	+	+	+
6		+	+	+	+
7		+	-	-	-
8		+	+	+	+
9		+	-	-	-
10		+	+	+	+
11		+	-	-	-
12		+	+	+	+
13		+	+	+	+
14		+	+	+	+
15		+	-	-	-
16		+	+	+	+
17		+	?	-	-
18		+	+	+	+
19		+	+	+	+
20		+	+	+	+
21		+	+	+	+
22		+	+	+	+
23		+	-	-	-
24		+	+	+	+
25		+	+	+	+
26		+	-	-	-
27		+	+	+	+
28		+	-	-	-
29		+	+	+	+
30		+	+	+	+
31		+	+	+	+

A. Petes: lac- : Lac+ (Lac+) 5.2%
 14 333
 Mal- lac+ 11%
 5 40

Embryonic transfer: lac 44+ Mal 7- 40+ M+L (abundant) 4-

B. lac+ (60) Mal M+L
 + + 35
 + - 6
 - + 6
 - - 11
 60

Mal- : + 17 : 43
 M+L- : + 19 : 43

Mal+ (40) 3 Lac + + 3
 37 lac+ + - 1
 + + 36

C. lac-
 + + 20
 + - 6
 - + 5
 - - 5

Mal- 6 M+L+
 5 M+L-

Some M+L- not induced
 induced

Attempts at λ diploids

846

H291 x W1027 on EMS lac.

- A) 20 isolated to EMS lac. - ^{stable} ^{on W578} EMS lac) all lysogenic
- B) 20 addnl. lact. ^{purify.} all lysogenic.

May 15, 1951.

A. W1606 x 843-6

EMS Lac 5 plates $S^R S^R / S^D$; Malt+, +

B " x 843-7

" " " $S^R S^D / S^D$; Malt+, +

A. 13 Lacv. all S^R .

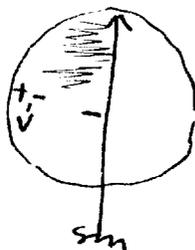
#12 shows some apparent

sensitivity to sm. Recheck.

Drop all to Pommersay for later v on S^D .

B. 20 Lacv. All S^S on EMS Lac. with sporadic S^R Lac+, Lac-.

On EMB Mal plates:



sm "bleaches" colonies
in its vicinity.

after 36 hours, Malt+, and poplite
see sm.

A W1177x ~~119~~1632
 B W1619x 1632

D(0), EMS Lac.

A. 1 ~~From D(0)~~
~~lac M⁺ M⁺~~

B 1.

lac Mal M⁺

+	+	+	6	15
+	+	-	4	
+	-	+	2	
+	-	-	1	
-	+	+	1	
-	+	-		
-	-	+		
-	-	-		

A 2 A 1

4	2
4 1	1
4 2	4
5	3
1	
1	
10	15

A1

COLONY NUMBER	LAC	MTL	MAL	XYL	MaC Sm	T1	T6
1	-	✓	-	-	1	S	S
2	+	✓	+	-	0	S	S
3	-	✓	-	0	0	S	S
4	-	✓	-	0	1	S	S
5	+	✓	+	-	1	S	S
6	+	✓	-	-	1	S	S
7	+	✓	+	-	1	S	S
8	+	✓	-	-	1	S	S
9	+	✓	+	+	0	S	S
10	-	✓	-	-	0	S	S
11	(+)	✓	+	-	1	S	S
12	+	✓	-	-	1	S	S
13	-	✓	-	-	0	S	S
14	+	✓	-	-	0	S	S
15	-	✓	-	-	0	S	S
16	-	✓	-	-	1	S	S
17	+	✓	-	-	1	S	S
18	+	✓	-	-	1	S	S
19	+	✓	-	-	0	S	S
20	+	✓	0	-	0	S	S
21	-	✓	-	+	0	S	S
22	0	-	0	-	0	S	S

B1

1	+	+	+	+	0	S	R
2	+	+	+	+	0	S	R
3	+	0	0	+	0	S	R
4	+	0	0	+	0	S	R
5	+	+	+	+	+	S	R
6	-	+	+	+	+	S	R
7	+	+	-	-	-	S	R
8	+	-	-	-	-	S	R
9	+	+	+	+	+	S	R
10	+	+	0	+	+	S	R
11	+	✓	+	+	+	S	R
12	+	✓	+	+	+	S	R
13	+	✓	+	+	+	S	R
14	-	✓	+	+	+	S	R
15	0	+	+	0	+	S	R
16	+	✓	+	+	+	S	R
17	0	+	+	0	+	S	R
18	0	+	+	0	+	S	R
19	+	✓	+	+	+	S	R
20	+	✓	+	+	+	S	R
21	0	+	0	0	+	S	R
22	0	+	0	0	+	S	R
23	+	✓	+	+	+	S	R
24	+	✓	+	+	+	S	R
25	+	✓	+	+	+	S	R
26	0	+	+	0	+	S	R
27	+	✓	+	+	+	S	R
28	+	✓	+	+	+	S	R

848A Selected as Mal+ or Lac+.

	LAC	GAL	MTL	XYL	MAL	Sm
1	+	+	+	+	+	
2	-	-	-	-	-	R
3	+	+	+	+	+ (-) -	R
4	-	-	-	-	-	R
5	+	+	+	+	+	
6	+	+	+	+	+	R
7	+	+	+	+	+	
8	+	+	+	+	+	
9	+	+	-	-	+	
10	+	+	-	+	+	
11	+	+	-	+	+	
12	+	-	-	-	-	R
13	+	-	-	-	-	
14	+	-	-	-	-	R
15	+	-	- (+) +	+	+	
16	+	+	-	+	+	
17	+	-	-	-	-	R
18	+	-	+	-	-	
19	+	-	-	-	-	R
20	-	-	-	-	-	R
21	+	+	-	+	-	R
22	+	+	-	+	+	
23	-	-	-	-	-	R
24	+	+ (-)	-	-	-	R
25	+	-	-	-	-	R
26	+	-	-	+	-	R
27	+	+	-	-	+	
28	+	-	-	-	-	R
29		-	-	-	-	R
30	-	-	-	-	-	R
31	+	-	-	-	-	R
32	+	-	-	-	-	R
33	+	+	-	+	+	
34	+	+	-	+	+	
35	+	-	-	-	-	R
36	+	-	-	-	-	R
37	+	+	-	-	+	
38	+	-	-	-	-	R

848B. Selected as lac -

MAL LAC MTL GAL XYL

1	+	-	-	+	+
2	+	-	-	+	+
3	+	-	-	+	+
4	+	-	-	+	+

Selected as MTL -

1	+	+	-	+	-
2	+	+	-	+	-
3	+	+	-	+	-
4	+	+	-	+	-
5	+	+	-	+	+
6	+	+	-	+	+
7	+	+	-	+	+
8	+	+	-	+	+
9	-	+	-	+	-
10	+	+	-	+	-
11	+	+	-	+	-

B2

COLONY NUMBER	LAC	MTL	MAL	XYL	Sm	T1	T6	
1	-	✓	0	+	0	0	R	S
2	-	✓	0	+	0	0	R	S
3	0	+	0	-	0	0	R	S
4	0	+	+	0	+	0	R	S
5	+	✓	+	(+)	+	0	R	S
6	+	✓	0	+	0	+	R	S
7	0	+	0	0	+	0	R	S
8	0	-	0	+	0	0	R	S
9	0	✓	0	+	0	0	R	S
10	+	✓	+	0	+	0	R	S
11	-	✓	+	0	+	0	R	S
12	-	✓	+	+	+	0	R	S
13	-	✓	0	0	+	+	R	S
14	+	✓	+	+	+	+	R	S
15	+	✓	+	+	+	+	R	S
16	0	+	0	-	+	0	R	S
17	+	✓	+	+	+	0	R	S
18	0	+	+	0	+	0	R	S
19	0	-	+	0	+	0	R	S
20	0	+	+	0	+	0	R	S
21	+	✓	+	+	+	+	R	S
22	+	✓	+	+	-	+	R	S
23	+	✓	+	+	+	+	R	S
24	+	✓	-	-	-	+	R	S
25	0	+	+	0	+	+	R	S
26	+	✓	-	+	+	+	R	S
27	+	✓	+	+	+	+	R	S
28	+	✓	+	0	-	0	R	S

A2

1	0	-	0	0				
2	-	-	0	-	R			
3	-	-	+	- (+)				
4	-	-	+	-				
5	-	-	+	-	R			
6	+	+	+	+	R			
7	-	+	+	+	R			
8	+	+	+	+				
9	0	+	+	0 (-)				
10	+	+	+	+				
11	-	-	-	+	R			
12	-	-	-	-	R			
13	-	-	-	-				
14	-	-	-	-				
15	0	-	0	- (+)				
16	-	-	-	-	R			
17	-	-	-	-	R			
18	-	-	-	-	R			
19	-	-	-	-				
20	- (+)	-	-	-	R			
21	-	-	+	-	R			
22	+	+	+	+	R			
23	0	-	0	0				
24	0	-	-	0				
25	0	-	-	0	R			

Segregation of H2B7.

849

May 14, 1951

(from P43A. Mal+)

	LAC	MAL	XYL	MTL	sm	EMIS	BHL	V ₁	
1	-	+	-	-		-	-		T-L-
2	-		-	-					
3	-		+	+					T-L-
4	-		-	-					
5	-		+	+					
6	-		-	-					
7	-		+	+			+-		
8	-		+	+					
9	-		-	-					
10	-		-	-					
11	+		+-	+-	R	+	+	✓	
12	-		+	+					
13	-		+	-					L-
14	-		-	-					
15	-		+	+					
16	+		+-	+-	R	+	+	✓	
17	-		-	-					
18	-		+	+					
19	-		+	+	R				
20	-		+	+					
21	-		-	-					
22	+		+	+-	R	+	+	✓	
23	-		-	-					
24	-		+	+					
25	-		-	-					
26	-		+	+					
27	-		-	-					
28	-		+	+					
29	-		-	-					
30	-		- (+)	- (+)					
31	-		-	-	R				
32	-		+	+	R				
33	-		-	-					
34	-		+	+					
35	-		+	+					
36	+		+	+	R	+	+	✓	
37	+		+	+	R	+	+	✓	
38	-		-	-					

May 16, 1951

H267 is V, R Gal -

from 843 a Mal -

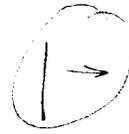
	LAC	MAL	XYL	MTL	Sm	Ems
1	-	(+)	(+)	(+)		
2	-	-	-	-		
3	---	(+)	(+)	(+)		
4	-	-	-	-		
5	-	-	-	-	R R	
6	-	-	-	-		
7	-	-	-	-		
8	-	-	-	-		
9	-	-	-	-	R R	R R
10	-	-	-	-	R R	R R
11	-	-	-	-	R R	R R
12	-	-	-	-		
13	-	-	-	-		
14	-	-	-	-	R R	R R
15	-	-	-	-		
16	-	-	-	-	R R	R R
17	-	-	-	-		
18	-	-	-	-		
19	---	---	---	---	R R	R R
20	-	-	-	-		
21	-	-	-	-	R R	R R
22	-	-	-	-		
23	-	-	-	-		
24	-	-	-	-		
25	-	-	-	-		
26	-	-	-	-		
27	-	-	-	-		
	-	-	-	-	R S	11 13
	-	+	+	+	S R	14
	-	+	+	+	S R	2
	-	+	+	+	S R	16
	-	+	+	+	S	1

Respiring microorganisms
UV - diploids

250

May 19, 1950?

H267 $.3 \times 10^{-6}$; .01 ml / plate



10^{10} AM Stohar (1) all plates.

A = control

B = uv 20

1. 10^{20} AM.

2. 11^{05}

3. 11^{30}

4. 11^{15}

5 7:00
1 0 (8,0) (18,2) (8,2) (0,1)
A

B
15,10 (1) pred.
6,7

2 45m (16,2)

12

3 1:20 14

7,9

4 2:55 20

3,12

5 3:40 ~~10~~ 40 *putting mostly 20*

all - 4

6 5:00 46,24
at 6 8:00

32 - , v; (1)
2 - 13 / fine